

REMARKS

This application has been reviewed in light of the final Office Action of January 26, 2004. Claims 1-21 are pending, and all claims stand rejected. In response, the following remarks are submitted. Reconsideration of this application, as amended, is requested.

Claims 1-19 and 21 are rejected under 35 U.S.C. § 112, first paragraph on the ground that “substantially a flat-bottomed hole” is indefinite. Applicant traverses this ground of rejection.

Claims 1-21 are rejected under 35 U.S.C. § 112, second paragraph. Applicant traverses this ground of rejection.

The explanations of the Section 112 rejections are full of hypotheses and arguments that have nothing to do with the present application. The speculation regarding what is “inherent” about orbital machining (final Office Action, page 3, line 2) and how cutting processes are performed (final Office Action, page 3, lines 1-15) are unrelated to the present application in which a hole is cut, and are not based on any reference of record dealing with hole cutting in composite materials. There is nothing “inherent” about Applicant’s process in relation to the prior art, because it is absolutely unique. For example, the statement “Also, in general in machining of the type described by Applicant, tools are not used to remove large amounts of material at one time...[citing Tool and Manufacturing Engineers Handbook]”. As will be discussed further below, Tool and Manufacturing Engineers Handbook has nothing to do with the cutting of holes, with the processing of composite materials, with the cutting of holes in composite materials, or with the cutting of holes in which the cutter is smaller than the hole. None of the references that are currently of record describes “machining of the type described by Applicant”. If they did, the prior art rejections would be Section 102

rejections, not Section 103 rejections. Accordingly, there is no relation of the reference to the present claims. Applicant will do its best to understand what this rejection is about and to respond, but awaits clarification of what is meant by “machining of the type described by Applicant” as related to any of the references, because none of the references relates at all to “machining of the type described by Applicant”.

The limitation that the bottom of the hole is flat is viewed in the context that the milling cutter has an effective cutter size less than the hole size. Alternatively stated, the cross-sectional size of the hole is larger than the cross-sectional size of the milling cutter. One way to use a milling cutter in this circumstance would be to drill straight down to some depth, withdraw the milling cutter from the hole, move it laterally, then drill straight down again, and repeat this procedure as many times as necessary to form the larger hole, i.e., to form a large-diameter holes with a series of small-diameter holes.

Another way to use it would be to drill straight down to the full depth of the material, and then move the milling cutter laterally to enlarge the hole, see para. [0032] of the present Specification and several of the applied patent references. That is not what happens in the present approach. As explained in detail in para. [0028]-[0030] of the present Specification, the milling cutter is used to cut a small distance longitudinally into the article and moved laterally to enlarge the hole to its full size; then the milling cutter is used to cut a further small distance longitudinally into the article and moved laterally to enlarge the hole to its full size; and so on. The longitudinal movement may be continuous or sequential, but the bottom of the hole remains substantially flat. Applicant took care to contrast this approach with approaches that are not within the scope of the invention, such as illustrated in Figure 7.

The explanation of the rejection states, at the top of page 3,

“For example, note that in orbital machining of a hole in general, inherently either the tool has to be used to machine the hole at one depth,

then advanced, then used to machine the hole at a slightly deeper depth, or the tool has to be constantly advancing while orbiting, thus producing a spiral tool path. In any case, Applicant has not specified either method, and neither method allows for the hole to be constantly flat-bottomed during the cutting process.” [emphasis added]

This position is incorrect, because Applicant clearly stated how its hole-cutting process proceeds and what is within the scope of the language of the claims and what is not within the scope of the language of the claims.

In para. [0029] of the Specification, Applicant fully and carefully explains its terminology regarding a hole of “substantially constant depth”:

“The rate of longitudinal advance is controlled such that the hole 54 has a substantially constant depth over its entire area as it is cut in the step 28. That is, the hole 54 is substantially flat bottomed on the surface 75 as illustrated in Figure 6....This gradual removal of the material at the bottom of the hole 54 may be accomplished by holding the milling cutter 50 at a constant position relative to the advance direction 70 and moving it in the lateral directions 72 to define the periphery 74 of the hole 54. It may instead be accomplished by moving the milling cutter 50 relatively slowly in the advance direction 70 while moving it in the lateral direction 72 as well. In the description, the milling cutter 50 is described as moving relative to the stationary composite material workpiece 40, but the relative movement may instead be accomplished by a movement of the composite material workpiece 40 relative to milling cutter 50, or by a combination of the two movements.” [emphasis added]

Applicant has clearly stated the nature of the hole-cutting process that is within the

scope of the claim language.

Applicant distinguished alternative approaches that are not within the scope of the invention, see paragraph [0032]:

“The present approach is to be contrasted with alternatives that are not within the scope of the invention, such as that illustrated in Figure 7. Here, a bit 90 is used to first drill entirely through a composite material workpiece 92 to define an initial through hole 94. If the hole is to be larger than the diameter of the bit 90, the bit 90 is thereafter moved laterally to create a larger hole 96. In this case, greater damage to the composite material at the periphery of either hole 94 or 96 is experienced, because the material removal forces applied at the periphery of the hole 94 or 96 are large and applied over a large distance at any moment.”

Applicant incorporates its discussion from the prior Amendment.

Those skilled in the art of cutting holes of a size larger than the cutter size in composite materials, as distinct from those wishing to concoct an attack on a clear disclosure on Section 112 grounds in the absence of any substantial prior art, understand what this means and understand how to distinguish infringing from non-infringing behavior.

The words that make up the phrases used in the claims are used in their conventional meanings. A “hole” is a “hollow place in a solid body or mass”. The “bottom” is the “lowest or deepest part of anything, as distinguished from the top”. “Flat” is “level, even, or without inequalities of surface” and “having a generally level shape or appearance”. “Substantially” is the adverb corresponding to the meaning of

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“substantial”, “of or pertaining to the essence of a thing” (i.e., essentially). All of these definitions come from Webster’s Encyclopedic Unabridged Dictionary of the English Language. See also the body of the present application, such as para. [0029].

The explanation of the rejection and the Response to Arguments is preoccupied with the meaning of “substantially” in “substantially flat”. A search of the PTO database since 1975 shows that the term “substantially flat” appears in 53,099 issued patents (as of October 20, 2003). The term “substantially flat” appears in the claims of 22,992 issued patents (as of October 20, 2003). Applicant reviewed a sample of these 22,992 issued patents that use “substantially flat” in the claims, and in no cases reviewed by Applicant was the term “substantially flat” further defined in the patent. Two examples are U.S. patents 4,772,376 and 6,633,643. Those skilled in the art understand this phraseology.

In short, the term “substantially flat” is widely used and well understood in the patent community and in the art, in the same context as the present claims.

The phrase in claim 7, “controlling the rate of longitudinal advance such that the hole remains substantially a flat-bottomed hole as it is cut”, means what it plainly says. The rate of longitudinal advance of the cutter into the workpiece maintains “substantially a flat-bottomed hole”. The specific rate of advance to maintain the substantially flat-bottomed hole will depend upon the specific composite material being cut.

Pages 22-25 of the final Office Action have superficially addressed Applicant’s remarks without addressing the substance. It is stated (final Office Action, page 22, line 23) that “...the hole still does not remain ‘flat’”. Yes, it does, because Applicant fully explained what is to be considered to be within the language a “flat-bottomed hole” as quoted above.

Regarding the use of “substantially flat” in other patents, the use is in exactly the same context as the present claims, specifically in relation to the description or character of a surface, and more specifically the degree of flatness or unflatness of a surface. Applicant did not address questions of the use of “substantially” in other contexts, such as “substantially smaller” (as in Eriksson ‘252, col. 5, line 7) or “substantially orthogonal” (as in Eriksson ‘281, col. 8, line 63) or anything else. (Neither of these uses of “substantially” is defined in the specification of the respective Eriksson patents.) Applicant specifically addressed “substantially flat”, the objected-to claim terminology. There has been no substantive response to this point.

The explanation of the rejection and the Response to Arguments, to the extent that they may be understood, are preoccupied with arguing that there is no quantitative definition of “substantially flat” in the application. That was not the intent of the present application or the present claims, which qualitatively compares “substantially flat” with other ways of producing holes. The vast majority of usages of adjectives such as “flat” in the conventional technical usage of those skilled in the art and in patents relates to distinguishing “substantially flat” from something else, such as “substantially curved”. That is the context in which the present application uses “substantially flat”, and in which the patents cited by Applicant use “substantially flat”.

In arguing the Section 112 rejections, the Examiner has refused to substantively address the points of para. [0028]-[0032] of the Specification, in which there is a clear, straightforward explanation to those skilled in the art of cutting holes in composite materials as to how to practice the present approach and how to tell if what they are doing falls within the scope of the present claims.

There is a further Section 112 rejection asserting that “brittle” as used in claims 12 and 20 is indefinite. Webster’s Encyclopedic Unabridged Dictionary defines brittle

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as "having hardness and rigidity but little tensile strength; breaking readily with a comparatively smooth fracture, as glass." That is how "brittle" is used in the present application and in the present claims.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 1-3, 7-8, and 10 are rejected under 35 U.S.C. § 103 over any of Thelin '847, Thelin '755, Taquist '674, Eriksson '252, or WO 94/17944, in view of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, pages 10-50 through 10-61 and 12-144 (hereinafter "Handbook"). Applicant traverses this ground of rejection, as best understood.

Handbook is clearly nonanalogous art. Stated alternatively, Handbook is not within the scope and content of the prior art that may be used in forming a Section 103 rejection. Its teachings are therefore not properly combined with the teachings of any of the five patent references. To be analogous art and properly used in forming a Section 103 rejection, a reference must be concerned with the same problem as another reference and the claims which are being addressed. See, for example, Medtronic, Inc. v. Cardiac Pacemaker, Inc., 220 USPQ 97, 104 (Fed. Cir. 1983), stating: "Faced with a rate-limiting problem, one of ordinary skill in the art would look to the solutions of others faced with rate-limiting problems." In the present case, the inventor was concerned with a problem in cutting holes in composite materials. See the Background section of the Specification, the balance of the Specification, and all of the claims. Handbook has nothing at all to do with cutting holes, or with the cutting of composite materials, and therefore is not properly within the scope of the prior art. It is therefore not properly applied in rejecting the present claims.

Handbook deals with the conventional milling of metals (see tables 10-5, 10-7,

10-8, and 12-56, for example) and not with the cutting of holes or composite materials. Composite materials have different material properties that lead to different behavior in hole-cutting operations, see para. [0004]-[0005] of the present Specification, as well as the discussions in any of Thelin '847, Thelin '755, Taquist '674, Eriksson '281, Eriksson '252, and WO 94/17944. For example, Taquist '674 states at col. 1, line 49-56: "The methods used to produce holes in composite laminates are the traditional....Also, newer methods such as are being used. The problem associated with these hole-forming methods as they are applied at the present time is that they are not sufficiently effective for various reasons from a technical/economic point of view." Handbook offers prime examples of the "traditional" approaches used in milling (not even hole forming), and there is no reason to believe that they are applicable to the cutting of holes in composite materials. There is no teaching in the Handbook that would relate to the technique to be used in the cutting of holes, or to composite materials, or to the cutting of holes in composite materials.

As Applicant notes in paragraph [0021] of the Specification, "The brittle ceramic matrix 44 of such composite materials is highly susceptible to damage and failure by splintering, fraying, and/or cracking when conventional hole-drilling techniques are used." Handbook discusses only such "conventional hole-drilling techniques" in metals, and not the present problem at all.

Nor does the Handbook deal with drilling a hole or drilling a hole that has a larger cross sectional than the milling cutter. The Handbook has nothing to teach regarding this type of hole cutting as recited in the present claims, a key point that will be discussed in greater detail subsequently.

In the Response to Arguments at page 27, line 12 et seq., there is an attempt to argue that somehow some of the discussion of Handbook can be used even though it is

admitted that it does not deal with the drilling of holes or with composite materials. There is an attempt to suggest that Handbook relates to something other than metals: "...particular materials, some of which are metal..." (final Office Action, page 27, line 15). In fact, every one of the materials discussed by Handbook as being milled is a metal. If the Examiner takes a contrary position, the precise location of the discussion of composite materials in Handbook must be set forth. Otherwise, the attempt to mislead the discussion by language such as "some of which are metal" must be discontinued. The discussion of Handbook relates only to metals, not composite materials such as set forth in the patent references, and it does not relate to the cutting of holes. The attempt to apply this reference to situations to which there was never any contemplation of its application by its authors is a per se hindsight forbidden reconstruction.

The following principle of law applies to all Section 103 rejections. MPEP 2143.03 provides, "To establish prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the single applied prior art reference clearly does not arguably teach some limitations of the claims.

Claim 1 recites in part:

"advancing the milling cutter longitudinally into the composite

material workpiece parallel to the axis of rotation at a rate of longitudinal advance, while laterally moving the milling cutter perpendicular to the axis of rotation to interpolate the hole, and while maintaining the hole substantially flat bottomed as the milling cutter advances”.

The five patent references each disclose an approach for producing a hole in a composite material that is admittedly different from the present approach. Otherwise, the rejection would have been a Section 102 rejection, an approach attempted in the first Office Action and now withdrawn.

The five patent references are interesting in that they do not teach the present approach, and in most cases teach directly away from the present approach.

Thelin ‘847 and Thelin ‘755 each teaches directly away from the present approach, by teaching that the through-hole is drilled first, and then the cutter is inserted and moved laterally, see Figures 2A-B.

Taquist ‘647 teaches creating a hole through the composite material, then producing an eccentric motion that laterally enlarges the hole, see col. 2, lines 56-63.

Eriksson ‘252 uses a simultaneous axial and radial machining, see col. 5, lines 13-15, but has no teaching of how these movements are coordinated.

WO ‘944 describes an apparatus that allows the drilling of holes in a piece of composite material, but never does say how the hole is drilled. Specifically, there is no teaching regarding whether a through-hole is first drilled, as in Thelin ‘847, Thelin ‘755, and Taquist ‘647, or whether some other technique is used.

The explanation of the rejection does not address these specific teachings of the five patent references. That is, the explanation of the rejection does not indicate that

three of the references (Thelin '847, Thelin '755, and Taquist '647) teach directly away from the present approach, Eriksson '252 is silent on its approach, and WO '944 teaches only the hole-cutting machine structure with no teaching about how the machine is actually used to cut a hole.

The explanation of the rejection admits that the patent references do not teach the claim limitations (final Office Action, page 5, lines 1-7). There is an attempt to find these limitations in Handbook. This attempt fails for several reasons.

First, as noted above, Handbook is nonanalogous art that does not deal with "cutting a hole" or with a "composite material workpiece" at all. Applicant explained in the Specification why a "composite material workpiece" has its own special problems in regard to hole cutting, and every one of the five patent references agrees with Applicant. The Examiner has not shown that the Handbook addresses problems or has any relevant teachings to the present problem, or the problems addressed by the five patent references, at all.

Second, the explanation of the rejection does not point to any location in Handbook that deals with a composite material. Claim 1 recites in part: "providing the composite material workpiece". Handbook does not have any teaching about a composite material workpiece.

Third, the explanation of the rejection never is able to point to a location in Handbook where Handbook has any teaching about a situation of "the milling cutter having an effective cutter size less than the hole size", as recited in claim 1. Handbook is concerned with the simple problem of milling a workpiece by lateral movement of the milling cutter (see Fig. 10-78). That is a completely different problem than drilling an oversize hole. The explanation of the rejection argues that simple lateral milling makes obvious the claim limitation "maintaining the hole substantially flat bottomed as the milling cutter advances", when of course Handbook has nothing to do with the type of

problem that the claim addresses, where the size of the cutter is less than the hole size. The discussion of Handbook's alleged teachings found at page 5, lines 8-17 of the final Office Action is an attempt to draw general inferences about a completely different problem and completely different material from an unrelated reference. Handbook does not discuss the cutting of holes at all. In Handbook, there is no hole to remain substantially flat-bottomed, because the milling cutter is simply moved laterally in the referenced portion of Chapter 10.

Fourth, for all of the argument, there is never any showing of a teaching in any of the references of the limitation "maintaining the hole substantially flat bottomed as the milling cutter advances" from claim 1.

Fifth, the discussion at page 12-114 of Handbook deals with thread milling and has no relation at all to hole drilling, even though this page is a central basis of the rejection. Applicant still cannot figure out what the relevance of Chapter 12 of Handbook, dealing with thread milling, might be, and there is no explanation in the final Office Action.

Claim 2 recites in part:

"providing a ceramic matrix composite material workpiece".

Claim 3 recites in part:

"providing a silicon carbide/silicon carbide composite material workpiece".

Neither reference has any such teaching.

Regarding claims 2-3, the explanation of the rejection makes the incredible

statement, “Applicant has not ascribed any particular criticality to the use of a ‘ceramic matrix composite...” Applicant certainly did so. Applicant notes in paragraph [0021] of the Specification, “The composite material workpiece may be of any operable type, but it is preferably a ceramic-matrix composite material wherein the matrix 44 is a nonmetallic, nonorganic, ceramic phase. The brittle ceramic matrix 44 of such composite materials is highly susceptible to damage and failure by splintering, fraying, and/or cracking when conventional hole-drilling techniques are used.” While composite materials pose difficult hole-forming problems, the ceramic-matrix composite material poses the greatest difficulty because of its brittle matrix. The present approach provides the solution for this difficult problem. Handbook, for example, does not even deal with this problem. The references have no teaching of the limitations of claims 2-3.

Claim 7 recites in part:

“controlling the rate of longitudinal advance such that the hole remains substantially a flat-bottomed hole as it is cut.”

None of the references has any such teaching.

Claim 10 recites in part:

“advancing the milling cutter longitudinally into the composite material workpiece by at least a thickness of the composite material workpiece, thereby forming a through hole”.

None of the references has any such teaching, in the context of the present claim

1.

The present rejection seeks to perform a hindsight reconstruction based upon unrelated references, which is technically unsupported and is legally improper, and in any event do not teach important claim limitations. The case authority and the MPEP provide guidance on this point. The present rejection is a Section 103 combination rejection. It is well established that a proper Section 103 combination rejection requires more than just finding in the references the elements recited in the claim (but which was not done here). To reach a proper teaching of an article or process through a combination of references, there must be stated an objective motivation to combine the teachings of the references, not a hindsight rationalization in light of the disclosure of the specification being examined. MPEP 2143 and 2143.01. See also, for example, In re Fine, 5 USPQ2d 1596, 1598 (at headnote 1) (Fed.Cir. 1988), In re Laskowski, 10 USPQ2d 1397, 1398 (Fed.Cir. 1989), W.L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 311-313 (Fed. Cir., 1983), and Ex parte Levengood, 28 USPQ2d 1300 (Board of Appeals and Interferences, 1993); Ex parte Chicago Rawhide Manufacturing Co., 223 USPQ 351 (Board of Appeals 1984). As stated in In re Fine at 5 USPQ2d 1598:

"The PTO has the burden under section 103 to establish a prima facie case of obviousness. [citation omitted] It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."

And, at 5 USPQ2d 1600:

"One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

Following this authority, the MPEP states that the examiner must provide such

an objective basis for combining the teachings of the applied prior art. In constructing such rejections, MPEP 2143.01 provides specific instructions as to what must be shown in order to extract specific teachings from the individual references:

“Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention when there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).”

* * * * *

“The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.” In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).”

* * * * *

“A statement that modifications of the prior art to meet the claimed invention would have been ‘well within the ordinary skill of the art at the time the claimed invention was made’ because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. Ex parte Levengood, 28 USPQ2d 1300 (Bd.Pat.App.& Inter. 1993).”

Here, there is set forth no objective basis for combining the teachings of the references in the manner used by this rejection, and selecting the helpful portions from

each reference while ignoring the unhelpful portions. The six primary references deal with composite materials, and Handbook deals with metals. An objective basis is one set forth in the art or which can be established by a declaration, not one that can be developed in light of the present disclosure. If the rejection is maintained, Applicant asks that the Examiner set forth the objective basis found in the references themselves for combining the teachings of the references, and specifically an objective basis why the teachings of Handbook concerning milling of metals in which no holes are cut should be considered as relevant to cutting holes in composite materials. If the conventional milling of metals is pertinent to the cutting of holes in composite materials, there should be a reference that says so. As it is now, there is nothing but Examiner's unsupported speculation.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 1-3 and 7-9 are rejected under 35 U.S.C. § 103 over either of Eriksson '252 or Eriksson '281, in view of Tool and Manufacturing Engineers Handbook, vol. 1, pages 10-50 through 10-61, and 12-144 ("Handbook"). Applicant traverses this ground of rejection, as best understood.

The prior discussion of Eriksson '252 and Handbook is incorporated here.

Eriksson '281 has a disclosure similar to that of Eriksson '252 in relevant aspects, except that it clearly teaches the use of a hole that does not have a flat bottom, see Figure 16.

Each Eriksson '281 patent explicitly teaches, "simultaneous machining the workpiece in both an axial and a radial direction..." (Eriksson '252 at col. 5, line 13 and Eriksson '281 at col. 8, lines 65-66. This is not a teaching that the hole is or could be

flat bottomed.

The explanation of the rejection asserts that Eriksson '252 and '281 teach "orbital machining", making reference to portions of the teachings of the Eriksson inventions. Eriksson never uses the term "orbital machining" to refer to his own invention. The only mention of "orbital machining" in these references occurs in a discussion of a prior art Swedish patent, see col. 2, line 48 of '252 and col. 3, line 1 of '281. This is an important point, because a conclusion of "orbital machining" has significant consequences that are not taught in either Eriksson reference. Any reference to "orbital machining" in relation to Eriksson's inventions must be deleted as Examiner's speculation unsupported in the references.

What is clear in both references is that there is no teaching remotely similar to the claim recitation "maintaining the hole substantially flat bottomed as the milling cutter advances" of claim 1. There is only a teaching of simultaneous machining in two directions.

Handbook, as noted earlier, is nonanalogous art that does not have any teachings on point to composite materials or to the machining of a hole that is larger than the cutter size. Handbook deals only with thread milling and lateral milling, but not to hole cutting. The explanation of the rejection is not able to point to any portion of Handbook that teaches "maintaining the hole substantially flat bottomed as the milling cutter advances".

Claim 2 recites in part:

"providing a ceramic matrix composite material workpiece"

Claim 3 recites in part:

“providing a silicon carbide/silicon carbide composite material workpiece”.

Neither reference has any such teaching.

Regarding claims 2-3, the explanation of the rejection makes the incredible statement, “Applicant has not ascribed any particular criticality to the use of a ‘ceramic matrix composite...” Applicant certainly did so. Applicant notes in paragraph [0021] of the Specification, “The composite material workpiece may be of any operable type, but it is preferably a ceramic-matrix composite material wherein the matrix 44 is a nonmetallic, nonorganic, ceramic phase. The brittle ceramic matrix 44 of such composite materials is highly susceptible to damage and failure by splintering, fraying, and/or cracking when conventional hole-drilling techniques are used.” While composite materials pose difficult hole-forming problems, the ceramic-matrix composite material poses the greatest difficulty because of its brittle matrix. The present approach provides the solution for this difficult problem. Handbook, for example, does not even deal with this problem. The references have no teaching of the limitations of claims 2-3.

Claim 7 recites in part:

“controlling the rate of longitudinal advance such that the hole remains substantially a flat-bottomed hole as it is cut.”

None of the references has any such teaching.

Applicant incorporates the prior discussion regarding the need for an objective basis for combining the teachings of the references.

Applicant asks that the Examiner reconsider and withdraw this ground of

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rejection.

Claim 4 is rejected under 35 U.S.C. § 103 over any of Thelin '847, Thelin '755, Eriksson '252, Taquist '674, Eriksson '281, Eriksson '252, or WO 94/17944, in view of Tool and Manufacturing Engineers Handbook, Vol. 1, Machining, pages 10-50 through 10-61 and 12-144 (hereinafter "Handbook"), and further in view of DE '365. Applicant traverses this ground of rejection, as best understood.

All of the references except DE '365 have been discussed previously, and the prior discussion is incorporated by reference.

DE '365 is in German. Some partial paraphrasing of DE '365 is provided, but there is no translation. In view of the significance of this reference, Applicant is unable to fully respond to this ground of rejection in the absence of a full translation of the reference. Applicant therefore asks that the PTO provide a full translation of the DE '365 reference, if it is to be relied upon further, and to issue a new non-final office action that includes the translated reference so that Applicant may fairly respond to the rejection. As it is now, Applicant cannot tell if DE '365 relates to composite materials, or to the flat-bottomed hole-cutting technology to which claims 4-6 relate. The rejection is misstated because it is in fact based on an Abstract of uncertain origin and accuracy, not on the reference.

At page 26, lines 15-16, the Response to Arguments asserts that it is permissible to violate the legal requirements and MPEP that mandate that a reference must be considered for the entirety of its teachings, not for some isolated, piecemeal point. The selective use of only the helpful teachings of a reference, and not giving weight to the overall teachings of the reference, in this manner is a per se hindsight reconstruction. This approach is not proper. In In re Mercer, 185 USPQ 774, 778 (CCPA 1975), the CCPA stated:

"The relevant portions of a reference include not only those teachings which would suggest particular aspects of an invention to one having ordinary skill in the art, but also those teachings which would lead such a person away from the claimed invention. See In re Lunsford, 53 CCPA 986, 357 F.2d 380, 148 USPQ 716 (1966)."

"The Board's approach amounts in substance, to nothing more than a hindsight 'reconstruction' of the claimed invention by relying on isolated teachings of the prior art without considering the over-all context within which those teachings are presented. Without the benefit of appellant's disclosure, a person having ordinary skill in the art would not know what portions of the disclosure of the reference to consider and what portions to disregard as irrelevant, or misleading. See In re Wesslau, 53 CCPA 746, 353 F.2d 238, 147 USPQ 391 (1965)."

Regardless of the Examiner's contentions to the contrary, the entirety of the reference is pertinent. If it is relied upon in forming a rejection, a translation must be provided so that Applicant may assess the entirety of the teachings. For example, the relied-upon Abstract does not state whether the workpiece is a composite material, or whether holes are being drilled in the workpiece that are larger than the cutting tool.

The discussion of "arguments against the references individually" (final Office Action page 26, line 10) is a straw man. Applicant was not arguing against the DE '365 reference individually, because in fact Applicant cannot read the reference and cannot determine what it says. No prima facie case of obviousness is made, because a prima facie case of obviousness requires use of the entire teachings of the reference and requires the showing of an objective basis for combining the teachings of the references, neither of which requirements is met by the present rejection.

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So for the moment Applicant cannot respond further to this rejection in view of the Examiner's refusal to follow the rules and provide Applicant a copy of the entirety of the relied-upon reference.

Claim 4 incorporates the limitations of claim 1. The prior discussion of the rejection of claim 1 is incorporated here. Unless DE '365 discusses maintaining a flat-bottom hole in a composite material, this combination of references does not teach the present approach.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 4-6 are rejected under 35 U.S.C. § 103 as unpatentable over WO 94/17944 in view of Handbook, and further in view of Constantine '249. Applicant traverses this ground of rejection, as best understood.

The WO '944 and Handbook references have been discussed previously, and the prior discussion is incorporated here. WO '944 teaches a device in which the tool holder 4 and thence the cutting tool may be moved longitudinally to deepen the hole, and laterally to widen the hole. Applicant cannot find a discussion of how these two movements are coordinated, if at all. For example, there is no teaching that Applicant can find that says the hole is not to be drilled by first drilling down to a selected depth by longitudinal movement of the tool holder 4, and then to move laterally to widen the hole. If the Examiner contends that this limitation is taught by WO '944, Applicant asks that its location be stated with specificity. Certainly WO '944 discusses some control capabilities of its device, but Applicant finds no teaching of the recited claim limitations. Neither Constantine '249 nor the Handbook has any such teaching.

Constantine '249 does not relate to composite materials or to the drilling of holes

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in composite materials, or to the affixing of a composite material workpiece to a backing fixture, or to the affixing of a composite material workpiece to a backing fixture as part of a process in which a hole is drilled.

Claim 4 recites in part:

“affixing the composite material workpiece to the backing fixture
with an adhesive material”.

Claim 5 has a similar recitation, but is specific that the affixing is with a thermoplastic adhesive material.

None of the references have any such teaching.

Applicant incorporates the prior discussion of the need for an objective basis for combining the teachings of the references.

Claims 11-14 and 17-18 are rejected under 35 U.S.C. § 103 over either of Eriksson ‘252 or Eriksson ‘281, in view of DE ‘365 and further in view of Handbook. Applicant traverses this ground of rejection, as best understood.

All of these references have been discussed previously, and that discussion is incorporated here.

Applicant repeats its request for a complete translation of DE ‘365 and the issuing of a new non-final office action so that Applicant may fairly respond to the rejection, if the rejection is to be maintained. It is not possible to tell from the brief information given in English what this reference teaches in detail, for example about the type and orientation of the machining as related to the manner of holding the workpiece.

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The references teach nothing about forming holes in ceramic matrix composite materials, as recited in all of the rejected claims.

Handbook teaches nothing about cutting holes in composite materials.

Applicant will be able to respond more fully to this ground of rejection when the translation of DE '365 is received.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 11-14, 17, and 19 are rejected under 35 U.S.C. § 103(a) over any of Thelin '847, Thelin '755, Eriksson '252, Taquist '674, or WO 94/17944, in view of DE '365 and in view of Handbook. Applicant traverses this ground of rejection, as best understood.

All of these references have been discussed previously, and that discussion is incorporated here.

Applicant repeats its request for a complete translation of DE '365 and the issuing of a new non-final office action so that Applicant may fairly respond to the rejection, if the rejection is to be maintained. It is not possible to tell from the brief information given in English what this reference teaches in detail, for example about the type and orientation of the machining as related to the manner of holding the workpiece.

All of these references have been discussed previously, and that discussion is incorporated here.

The references teach nothing about forming holes in ceramic matrix composite materials, as recited in all of the pending claims.

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Handbook teaches nothing about cutting holes in composite materials.

Applicant will be able to respond more fully to this ground of rejection when the translation of DE '365 is received.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 11-17 and 19 are rejected under 35 U.S.C. § 103 over WO '944 in view of Constantine '391 and in view of Handbook. Applicant traverses this ground of rejection, as best understood.

WO '944 and Handbook have been discussed previously, and that discussion is incorporated here.

WO '944 teaches a device in which the tool holder 4 and thence the cutting tool may be moved longitudinally to deepen the hole, and laterally to widen the hole. Applicant cannot find a discussion of how these two movements are coordinated, if at all. For example, there is no teaching that Applicant can find that says the hole is not to be drilled by first drilling down to a selected depth by longitudinal movement of the tool holder 4, and then to move laterally to widen the hole. There is no teaching of the limitation: "controlling the rate of longitudinal advance such that the hole has a substantially constant depth over its entire area as it is cut; and, after the hole is completed" as recited in claim 11. If the Examiner contends that this limitation is taught by WO '944, Applicant asks that its location be stated with specificity. Certainly WO '944 discusses some control capabilities of its device, but Applicant finds no teaching of the recited limitation. Neither Constantine '249 nor the Handbook has any such teaching.

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Claims 12 and 13 respectively recite a ceramic matrix composite material workpiece with a brittle matrix, and a silicon carbide/silicon carbide composite material workpiece. There is no teaching in either reference of these limitations. WO '944 teaches the use of polymer composite materials, and Constantine '249 and Handbook do not deal with composite materials at all. Applicant incorporates the prior discussion of claims 2 and 3, which have similar recitations.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claim 20 is rejected under 35 U.S.C. § 103(a) over any of Thelin '847, Thelin '755, Taquist '674, Eriksson '252, or WO 94/17944, or Eriksson '281 in view of DE '365. Applicant traverses this ground of rejection, which is ambiguous and incomprehensible.

Does this statement of a rejection attempt to formulate a rejection over (1) Thelin '847, Thelin '755, Taquist '674, Eriksson '252, or WO 94/17944, or (2) Eriksson '281 in view of DE '365? Or is the statement a rejection over (1) Thelin '847, Thelin '755, Taquist '674, Eriksson '252, or (2) WO 94/17944 or Eriksson '281 in view of DE '365? Or is it something else? Clarification is required.

These references have been discussed previously, and that discussion is incorporated here.

Applicant repeats its request for a complete translation of DE '365 and the issuing of a new non-final office action so that Applicant may fairly respond to the rejection, if the rejection is to be maintained. It is not possible to tell from the brief information given in English what this reference teaches in detail, for example about the type and orientation of the machining as related to the manner of holding the workpiece.

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Applicant will be able to respond more fully to this ground of rejection when the translation of DE '365 is received.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection, or at least make it comprehensible.

Claim 21 is rejected under 35 U.S.C. § 103 over any of Thelin '847, Thelin '755, Eriksson '252, Taquist '674, Eriksson '252, or WO 94/17944, or Eriksson '281 in view of DE '365, and further in view of Handbook. Applicant traverses this ground of rejection, which is ambiguous and incomprehensible.

Does this statement of a rejection attempt to formulate a rejection over (1) Thelin '847, Thelin '755, Eriksson '252, Taquist '674, Eriksson '252, or WO 94/17944, or (2) Eriksson '281 in view of DE '365, and further in view of Handbook? Or is the statement a rejection over (1) Thelin '847, Thelin '755, Eriksson '252, Taquist '674, Eriksson '252, or (2) WO 94/17944, or Eriksson '281 in view of DE '365, and further in view of Handbook? Or is the statement a rejection over (1) Thelin '847, Thelin '755, Eriksson '252, Taquist '674, Eriksson '252, in view of Handbook, or (2) WO 94/17944 or Eriksson '281 in view of DE '365, and further in view of Handbook? Or is it something else?

These references have been discussed previously, and that discussion is incorporated here.

Applicant repeats its request for a complete translation of DE '365 and the issuing of a new non-final office action so that Applicant may fairly respond to the rejection, if the rejection is to be maintained. It is not possible to tell from the brief information given in English what this reference teaches in detail, for example about the type and orientation of the machining as related to the manner of holding the workpiece.

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Applicant will be able to respond more fully to this ground of rejection when the translation of DE '365 is received.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection, or at least make it comprehensible.

Applicant submits that the application is now in condition for allowance, and requests such allowance. The Commissioner is hereby authorized to charge any additional fees and credit any overpayments to Deposit Account No. 50-1059.

Respectfully submitted,
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Dated: April 15, 2004

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